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A revision of species from the tribe *Lasiopetaleae* (Byttnerioideae: Malvaceae) with rostrate anthers

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Abstract

Shepherd, K.A. & Wilkins, C.F. A revision of species from the tribe *Lasiopetaleae* (Byttnerioideae: Malvaceae) with rostrate anthers. *Nuytsia* 25: 171–189 (2015). An informal group of species within the tribe *Lasiopetaleae* Gay, characterised by a lack of stipules and distinctive, rostrate anthers, are revised and included in *Lasiopetalum* Sm. Revised descriptions are provided for the reinstated *L. laxiflorum* (Benth.) F.Muell. and newly elevated subspecies of *L. glutinosum* (Lindl.) F.Muell. (*L. glutinosum* subsp. *glutinosum* and *L. glutinosum* subsp. *latifolium* (Benth.) K.A.Sheph. & C.F.Wilkins). Three new species of conservation concern are recognised (*L. cenobium* K.A.Sheph. & C.F.Wilkins, *L. trichantherum* K.A.Sheph. & C.F.Wilkins and *L. venustum* K.A.Sheph. & C.F.Wilkins). A distribution map, images and a key to the group are included.

Introduction

This revision focuses on an informal group of taxa within the tribe *Lasiopetalae* Gay which lack stipules, have long, apically-beaked, acuminate anthers (referred to here as rostrate anthers), and lack prominent ribs on the inner surface of the petaloid calyx. Historically there has been considerable confusion regarding the generic placement of this group. Lindley (1839) and Steudel (1845) included the rostrate-anthered species under *Thomasia* Gay, while Steetz (1848) proposed a new genus *Rhynchostemon* Steetz to accommodate them. Bentham (1863) did not support the segregation of these taxa and transferred the group back to *Thomasia*. Finally, Mueller (1881) determined that the group should in fact be included in *Lasiopetalum* Sm.; however, subsequent workers did not adopt this change. The placement of three, more recent phrase-named taxa with rostrate anthers also reflects this on-going confusion as they are currently recognised under both genera (Western Australian Herbarium 1998–).

Nuclear and chloroplast DNA sequence analyses support the inclusion of the rostrate-anthered group in *Lasiopetalum* (Whitlock & Wilkins, unpublished data). Key morphological characters also infer this, as these taxa collectively lack stipules or a prominent rib on the inner surface of the petaloid calyx; features that are absent in *Lasiopetalum* but present in other species of *Thomasia*. Based on this evidence we are satisfied with the inclusion of this group in *Lasiopetalum* and as a consequence reinstate *L. glutinosum* (Lindl.) F.Muell. and *L. laxiflorum* (Benth.) F.Muell., elevating the varieties of the former to subspecies (*L. glutinosum* subsp. *glutinosum* and *L. glutinosum* subsp. *latifolium* (Benth.)

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K.A.Sheph. & C.F.Wilkins). The three informally recognised taxa with rostrate anthers are also described here with *T.* sp. New Norcia (Cayser s.n. Nov. 1918) and *T.* sp. Gingin (F. & J. Hort 1511) recognised as *L. cenobium* K.A.Sheph. & C.F.Wilkins and *L. venustum* K.A.Sheph. & C.F.Wilkins respectively, while *L.* sp. Northam (F. Hort 1196) is named as *L. trichantherum* K.A.Sheph. & C.F.Wilkins.

Methods

Foliage and floral characters were scored from fresh or spirit material preserved in 70% ethanol. Detailed measurements of floral characters were also made by rehydrating flowers from specimens lodged at PERTH. The definition of hair density and the recognition of the three bracts subtending the calyx as the 'epicalyx' follows Wilkins and Chappill (2001).

Distribution maps were compiled using QGIS Version 1.8.0. 'Lisboa' freeware based on locality information of specimens lodged at PERTH and include *Interim Biogeographic Regionalisation for Australia* (IBRA) version 7 bioregions (Department of the Environment 2013). The distribution of *L. cenobium* has not been mapped as this species is only known from two specimens that cite 'New Norcia' as the collection locality; however, no extant populations have been relocated in the area.

Examination of type specimens from various national and international herbaria was facilitated via loans to PERTH or through personal visits. Images of type material were also viewed via Global Plants (http://plants.jstor.org/) and the Museum National d'Histoire Naturelle (P) online database (http://science.mnhn.fr/institution/mnhn/search).

Taxonomy

The rostrate-anthered group in *Lasiopetalum* includes five species and a subspecies and is characterised by the following combination of characters: *stipules* absent; *leaves* ovate to narrowly ovate, often remaining trilobed at maturity with the base cordate or rounded; *inflorescence* leaf-opposed, monochasial, viscid; *calyx* without prominent ribs, the inner base dark red or green; *staminal* tube and *staminodes* absent; *anthers* 5, > 3 mm long, rostrate, deep red with white apical pores *c.* 1.5 mm long, introrse dehiscence; *ovary* with three carpels and two ovules per carpel, style glabrous or with scattered, white, stellate hairs at the base; *fruit* carpels with a persistent, woody style base; *seed* > 2:1 (length:width), glossy and glabrous or dull and stellate hairy, arillate.

Key to species of *Lasiopetalum* with rostrate anthers

1. Petals present; epicalyx bracts 1.5–3.5 mm long; anthers 2.5–4 mm long (Whicher Range) ..... **L. laxiflorum**

1: Petals absent; epicalyx bracts 3–14 mm long; anthers 3.5–6.5 mm long **2**

2. Epicalyx bracts towards base of pedicel; calyx lobes narrowly ovate; anthers with dense, stellate hairs (Northam area) ..... **L. trichantherum**

2: Epicalyx bracts subtending the calyx; calyx lobes ovate; anthers glabrous **3**

3. Bracts filiform, (6–)8–14 mm long, 0.15–0.3 mm wide, epicalyx bracts 6–14 mm long; calyx outer surface with moderately dense, stellate hairs throughout **4**

4. Mature leaves ovate, upper surface prominently rugose and persistently stellate hairy; calyx inner surface glabrous towards the base; ovary with papillose glands (New Norcia) ..... **L. cenobium**

4: Mature leaves trilobed, not rugose, glabrescent; calyx inner surface with fine red or white, glandular trichomes; ovary with dense, white, stellate hairs (Boonanarring NR) ..... **L. venustum**

3: Bracts very narrowly ovate, 2.5–5.8 mm long, 0.3–0.5 mm wide, epicalyx bracts 3.3–9 mm long; calyx outer surface viscid, with dense, globular glands, sometimes also with white, stellate hairs at the base **5**

5. Mature leaves usually trilobed; pedicel and calyx outer surface with dense, globular glands only or rarely also with scattered, white, stellate hairs at the base of the calyx (Darling Scarp)..... **L. glutinosum** subsp. **glutinosum**

5: Mature leaves ovate or shallowly trilobed; pedicel and calyx outer surface with dense, globular glands and with moderately dense to dense, stellate hairs at the base of the calyx (Moora to Boddington) ..... **L. glutinosum** subsp. **latifolium**

Lasiopetalum cenobium K.A.Sheph. & C.F.Wilkins, *sp. nov.*

Type: New Norcia, Western Australia, November 1918, *A. Cayser s.n.* (*holo*: PERTH 01298348!).

Thomasia sp. New Norcia (Cayser s.n. Nov. 1918), Western Australian Herbarium, in *FloraBase*, http://florabase.dpaw.wa.gov.au/ [accessed 3 July 2014].

Habit unknown. *Stems* densely stellate-tomentose, with large, white and ferruginous-centred, stellate hairs, with a stalk to 1.3 mm long and up to 12 arms each to 1.3 mm long, over smaller, dense, sessile to short-stalked, white, stellate hairs, tardily glabrescent. *Petioles* 9–24 mm long, with indumentum as for young stems. *Leaf blades* ovate, 17–43 mm long, 12–29 mm wide, base cordate, apex sub-acute, surface rugose and discolorous (green adaxially, yellow-green abaxially); margin entire and strongly recurved; abaxial surface densely tomentose with stalked and sessile, white and ferruginous-centred, stellate hairs with up to 12 arms each to 1 mm long, over smaller, shortly-stalked, white, stellate hairs; adaxial surface with scattered to moderately dense, sessile, white, stellate hairs each with *c.* 6 arms to 1.3 mm long. *Inflorescence* a leaf-opposed, loose, simple monochasium, 75–95 mm long with 3–5 flowers; *peduncles* 28–65 mm long with indumentum as for the stems. *Pedicels* 8.5–10 mm long, with indumentum as for the stems. *Bract* filiform, *c.* 8 mm long, 0.15–0.2 mm wide. *Epicalyx bracts* 3, slightly unequally attached 0.3–1.5 mm below the calyx, filiform, 10.5–14 mm long, 0.2–5 mm wide. *Calyx* pink, dark red towards the base, 11.5–15 mm with a tube 6–7.5 mm long; lobes ovate, *c.* 9 mm long, 9 mm wide, acute; outer surface densely stellate-hairy at the base, sparser towards the apex, the hairs with 6–12 arms each to 1 mm long, becoming *c.* 0.2 mm long towards apex; inner surface lobe apex and margin with moderately dense, fine, white, stellate hairs *c.* 0.2 mm long, glabrous at the base. *Petals* absent. *Staminal filaments* glabrous, 1.3–1.5 mm long, 0.4–0.5 mm wide. *Anthers* narrowly ovate, dark red, white towards the apex, 4.4–5 mm long, 0.8–1.1 mm wide, glabrous; pollen white. *Ovary* 1.5–2.7 mm long, 0.8–2.1 mm wide, the outer surface with papillose, glandular trichomes to 0.15 mm long, the inner surface stellate-hairy. *Style* 3.4–3.8 mm long, *c.* 0.2 mm wide, glabrous. *Fruit* ellipsoid, *c.* 5 mm long, *c.* 3.5 mm wide, the outer surface with residual, papillose, glandular trichomes, the inner surface glabrescent. *Seed* ellipsoid, *c.* 2.7 mm long, 1.4 mm wide, dark brown, smooth, glabrous; aril a yellow cap, *c.* 1.7 mm long, 0.8 mm wide. (Figure 1)

Diagnostic features. This species is distinguished from all other rostrate-anthered species of *Lasiopetalum* by the following unique combination of characters: large, ovate leaves 17.5–43 mm long and 12.5–28.5 mm wide with a distinctive rugose surface, strongly recurved margin and persistent, scattered to

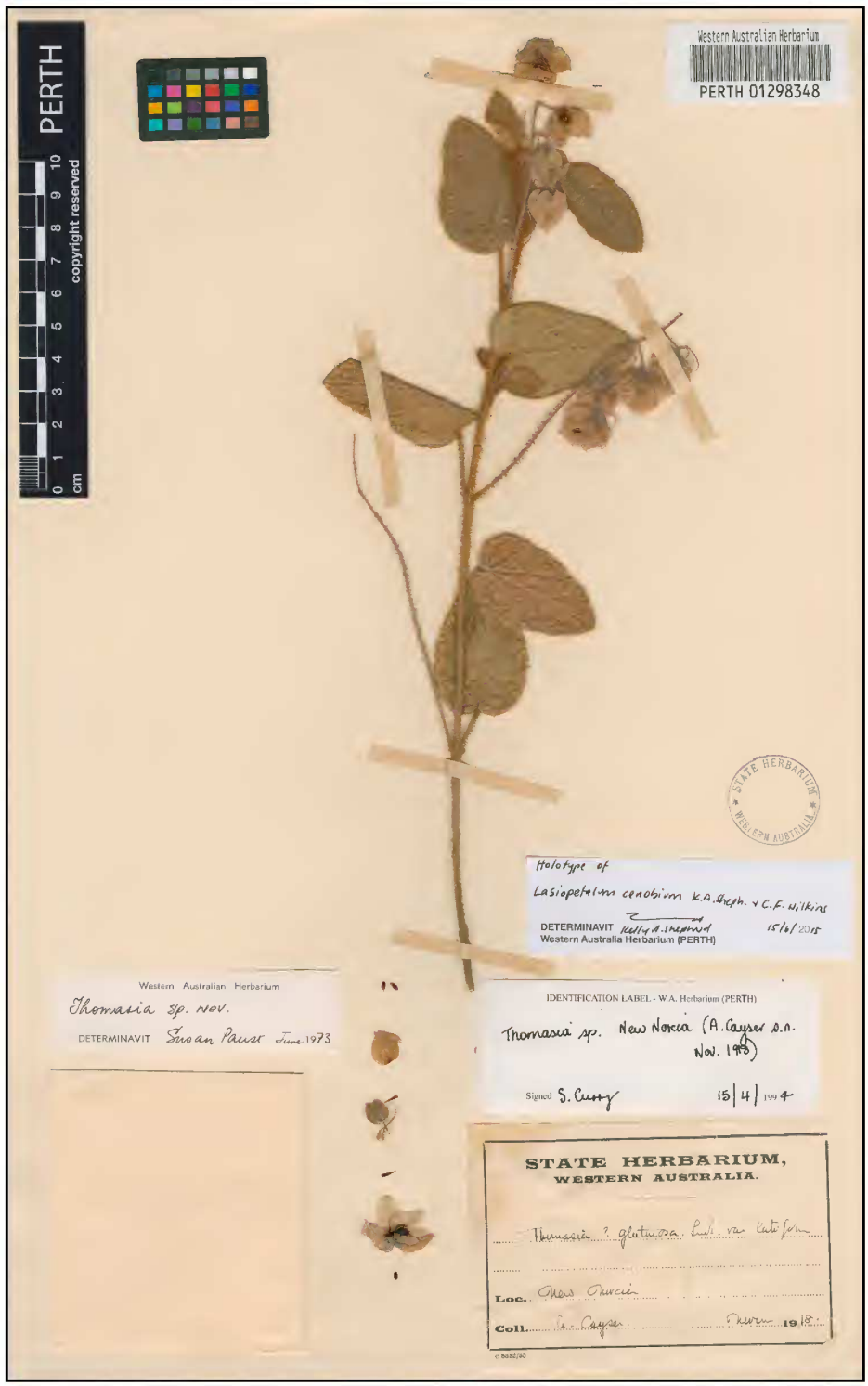

Figure 1. Holotype of *Lasiopetalum cenobium* (*A. Cayser s.n.* PERTH 01298348).

moderately-dense, stellate hairs on the adaxial surface; the entire outer surface of the calyx is covered in stellate hairs with 6–12 arms up to 1 mm long at the base; the ovary outer surface is covered in small, papillose glands and the inner surface has stellate hairs.

Specimen examined. WESTERN AUSTRALIA: New Norcia, Nov. 1918, *Anonymous s.n.* (PERTH 01298321).

Phenology. Flowers and fruits were observed on the specimens collected in November.

Distribution and habitat. *Lasiopetalum cenobium* is currently only known from two specimens labelled as being collected from New Norcia in the Avon Wheatbelt bioregion in Western Australia. As no extant populations are currently known the distribution and habitat of this species cannot be confirmed.

Conservation status. *Lasiopetalum cenobium* is only known from two collections made in 1918 and numerous searches in the region have failed to relocate it. It is currently listed, under the name *Thomasia* sp. New Norcia (Cayser s.n. Nov. 1918), as Priority One under Department of Parks and Wildlife Conservation Codes for Western Australian Flora (Jones 2014). If populations are not located following further surveys its status may need to be revised to Presumed Extinct (X).

Etymology. This epithet is derived from the Latin *cenobium* (monastery) formed as a noun in apposition, in recognition of the fact that this species is only known from two specimens collected from New Norcia, a monastic town established by Spanish Benedictine Monks in 1847.

Affinities. *Lasiopetalum cenobium* is morphologically most similar to *L. venustum* due to both species having long, filiform bracts and moderately dense, stellate hairs over the entire outer surface of the calyx. It is readily distinguished from *L. venustum* by its ovate leaves, which are rugose and persistently stellate hairy (*cf.* glabrescent, non-rugose, strongly trilobed leaves), its glabrous inner calyx (*cf.* surface with fine, red or white, glandular trichomes) and ovary covered in papillose glands externally and stellate hairs within (*cf.* white, stellate hairs externally and glabrous within).

Lasiopetalum cenobium is also superficially similar to *L. glutinosum* subsp. *latifolium* as both taxa have ovate leaves and stellate hairs on the outer calyx but it can be separated by its rugose leaves (*cf.* smooth), larger calyx, 11.5–15 mm long (*cf.* 6–11.5 mm long) with broader calyx lobes, 9 mm wide (*cf.* 4.5–7.8 mm wide), which have dense, stellate hairs comprising 6–12 arms covering the outer surface (*cf.* with scattered to dense stellate hairs with *c.* 6 arms, confined to the base of the outer surface of the calyx). The ovary of *L. cenobium* is covered in papillose glands while specimens of *L. glutinosum* subsp. *latifolium* usually have only dense, stellate hairs on the ovary (rarely intermixed with glandular hairs). There are, however, a few collections from the northern end of its range around Mogumber and Moore River that also have papillose glands on the ovary (i.e. *E.A. Griffin* 5985; *C.A. Gardner s.n.*, PERTH 02705664).

Notes. While caution should always be exercised when delimiting taxa based on a limited number of herbarium collections (particularly in the case where there are no known extant populations), it is believed that the morphological differences evident in this case support the recognition of *L. cenobium* as a distinct species. It is hoped that the formal naming and describing of this species will facilitate its rediscovery.

The two known specimens of *L. cenobium* are both labelled as being collected from New Norcia in November 1918. While it is possible that these specimens are duplicates of the same gathering, this cannot be known for certain. Consequently, PERTH 01298321 is not treated as type material herein.

Lasiopetalum glutinosum (Lindl.) F.Muell., *Fragm.* 11(93): 113 (1881). *Thomasia glutinosa* Lindl., *Sketch Veg. Swan R.* xviii (1839); Steud. in Lehm., *Pl. Preiss.* 1(2): 235 (1845); Benth., *Fl. Austral.* 1: 256 (1863). *Rhynchostemon glutinosus* (Lindl.) Steetz in Lehm., *Pl. Preiss.* 2(2–3): 334 (1848); *Rhynchostemon glutinosum orth. var.*, Benth., *Fl. Austral.* 1: 256 (1863), *in syn. Type*: not cited. *Type specimens*: Swan River [Western Australia], 1839 [1835–1838], *J. Drummond s.n.* (*lecto*, here designated: CGE 06802! [left specimen]; *isolecto*: CGE 12645!; K 686003!; MEL 236539!). Swan River [Western Australia, 1831], *Capt. Mangles s.n.* (*syn*: CGE 06802! [right specimen]).

Multi-stemmed, spreading, viscid, *subshrub to shrub*, 0.2–1 m high, 0.2–1.5 m wide. *Young stems* stellate-tomentose, with scattered, white and ferruginous-centred, stellate hairs, with a stalk to *c.* 0.5 mm long and up to 24 arms each to 0.5 mm long, over smaller, dense, sessile or short-stalked, white and ferruginous-centred stellate hairs, glabrescent. *Petioles* 4–6.5 mm long, indumentum as for young stems. *Leaf blades* ovate and often trilobed, 10–53 mm long, 3–44 mm wide, base cordate, apex sub-acute or acute, discolorous (mid-green becoming pale green adaxially, cream or pale tan abaxially); margin entire and recurved; abaxial surface densely tomentose with stalked and sessile, white and ferruginous-centred, stellate hairs with 6–15 arms each to 0.2–1.5 mm long, over smaller, dense, white, stellate hairs; adaxial surface with scattered to moderately dense, sessile, white and ferruginous-centred, stellate hairs with 6–12 arms each to 0.25–0.4 mm long, sometimes with scattered glands to 0.1 mm long, tardily glabrescent. *Inflorescence* a leaf-opposed, loose, simple monochasium, rarely with subsidiary branching, 38–111 mm long with 2–12 flowers; *peduncles* 22–49 mm long, glabrous or scattered to densely tomentose with sessile and shortly stalked, white and ferruginous, stellate hairs with *c.* 12 arms each to 1 mm long, sometimes with smaller, white, stellate hairs beneath. *Pedicels* 4.5–9 mm long, viscid with dense, minutely globular glands *c.* 0.1 mm across, glabrous or with white and ferruginous-centred, stellate hairs with *c.* 12 arms each to 1 mm long, over smaller, white, stellate hairs. *Bract* very narrowly ovate to elliptic, 2.5–5.8 mm long, 0.3–0.5 mm wide with scattered or moderately dense, sessile and stalked (*c.* 0.8 mm long), white and ferruginous-centred, stellate hairs with *c.* 12 arms each to 1 mm long. *Epicalyx bracts* 3, attachment 0.2–1.2 mm below the calyx, narrowly ovate, lanceolate to linear, 3.3–9 mm long, 0.2–0.8 mm wide, central longer and wider than laterals. *Calyx* bright pink, dark red or infrequently green towards the base, 5.5–12 mm with a tube 1.8–4.4 mm long; lobes ovate to broadly ovate, 4.3–8.5 mm long, 4–8.5 mm wide, acuminate; outer surface viscid with dense, globular glands *c.* 0.1 mm across, glabrous or base with scattered, moderately dense to dense stellate hairs, the hairs with up to 6 arms each to 1–1.5(–2) mm long; inner surface with moderately dense, white, simple and stellate hairs on the apex and margins the hairs 0.1–0.2 mm long, glabrous at base, rarely with scattered glands to 0.1 mm long. *Petals* absent. *Staminal filaments* glabrous, 0.8–2 mm long, 0.3–0.4 mm wide. *Anthers* narrowly ovate, dark red, white towards the apex, 3.5–5.8(–6.5) mm long, 0.9–1.3 mm wide, glabrous; pollen white. *Ovary* 1–1.1 mm long, 1.1–1.3 mm wide, outer surface tomentose, usually with white, stellate hairs, these rarely intermixed with glandular hairs; inner surface glabrous. *Style* 3.8–5.3 mm long, 0.15–0.2 mm wide, glabrous with scattered, white, stellate hairs at the base. *Fruit* ellipsoid, *c.* 3 mm long, *c.* 3.5 mm wide, outer surface with residual, white, sessile, stellate hairs, inner surface glabrous. *Seed* ellipsoid, 2–2.3 mm long, 0.9–1 mm wide, dark brown, smooth, glabrous; aril a yellow cap, 0.9–1 mm long, 0.5–0.7 mm wide. (Figure 2)

Diagnostic features. *Lasiopetalum glutinosum* is a multi-stemmed, viscid, subshrub which can be distinguished from the other rostrate-anthered species by the following features: leaves discolorous,

ovate, entire to trilobed, 10–53 mm long; bracts very narrowly ovate to elliptic, 2.5–5.8 mm long, 0.3–0.5 mm wide with moderately dense or scattered, stellate hairs, with *c.* 12 arms, to 1 mm long; epicalyx bracts 3.3–9 mm long; outer surface of the calyx viscid and covered in dense, globular glands, sometimes also with white, stellate hairs at the base.

Typification. Lindley based his descriptions in *A sketch of the vegetation of the Swan River Colony* on material contained within his personal herbarium collected in part by James Drummond and Capt. Mangles (Lindley 1839: ii). There is a single sheet in his herbarium (CGE 06802) that holds two specimens of *T. glutinosa*. The left hand individual labelled 'Swan River, Drummond 1839' is a good match for the protologue. This specimen was annotated as a lectotype by Alex George in 1968;

Figure 2. *Lasiopetalum glutinosum*. A – subsp. *latifolium* habit (*K.A. Shepherd & S.R. Willis* KS 1565); B – subsp. *glutinosum* inflorescence highlighting the viscid flowers with scattered stellate hairs confined to the narrow, short bracts (*K.R. Thiele* KRT 3694); C – subsp. *latifolium* flower and buds showing moderately dense stellate hairs on the peduncle, pedicel, epicalyx bracts and base of the outer calyx (*K.A. Shepherd & S.R. Willis* KS 1565). Images by K.A. Shepherd (A, C) and K.R. Thiele (B).

however, his lectotypification has not been published. We concur with this and, as such, the left hand specimen is designated herein as the lectotype. The right hand specimen on the same sheet is a Capt. Mangles collection from the 'Swan River' and is treated as a syntype.

Lasiopetalum glutinosum (Lindl.) F.Muell. subsp. **glutinosum**

Leaves narrowly ovate to ovate, 8–50 mm long, 6–41 mm wide, apex sub-acute or acute, base cordate, margin trilobed, rarely entire. *Pedicels* 4.5–9 mm long, viscid with dense, minute, globular glands *c.* 0.1 mm across, rarely with a few sessile, white, stellate hairs. *Calyx* outer surface viscid with dense, minute, globular glands *c.* 0.1 mm across, rarely with scattered, white, stellate hairs. (Figure 2B)

Selected specimens. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 12 Nov. 1982, *Y. Armstrong s.n.* (PERTH 01086421); 16 Nov. 1953, *H.F. & M. Broadbent* 1859 (BM 31001); 19 Sep. 1971, *R.A. Congdon* 36.1 (PERTH); 17 Oct. 1978, *R.J. Cranfield* 862 (PERTH); 2 Oct. 1997, *R.J. Cranfield* 11416 (PERTH); 19 Sep. 1996, *A. Markey* 233 (PERTH); 9 Dec. 1996, *A. Markey* 1020 (PERTH); 29 Sep. 1969, *C. Muldownie* 2 (PERTH); 2 Sep. 1971, *S. Paust s.n.* (MEL, PERTH 01086464); 19 Sep. 1921, *O.H. Sargent* 1054 (BM 31027 [two right hand specimens]); 18 Sep. 1977, *J. Seabrook* 250 (PERTH); 11 Oct. 2008, *K.R. Thiele* 3694 (PERTH); 1 April 2002, *C.F. & J.A. Wilkins* CW 1522 (PERTH).

Phenology. Flowering specimens have been recorded from September to December. Fruiting material was observed on specimens collected from November to January.

Distribution and habitat. *Lasiopetalum glutinosum* subsp. *glutinosum* is typically found near Perth, on the Darling Scarp from Helena Valley to Byford, in the Jarrah Forest and Swan Coastal Plain bioregions of Western Australia; however, there is a single outlier collected by C.A. Gardner on the 5th October 1942 from near Northam (Figure 3). This subspecies occurs in open woodland dominated by combinations of *Eucalyptus marginata*, *Corymbia calophylla*, *Banksia menziesii* and *B. attenuata* and in open, low scrub over heath, on steep slopes of lateritic gravel, clay or sandy loam near granite outcrops and creeklines.

Conservation status. *Lasiopetalum glutinosum* subsp. *glutinosum* was recently listed as Priority Three under Department of Parks and Wildlife Conservation Codes for Western Australian Flora, under the name *Thomasia glutinosa* Lindl. var. *glutinosa* (Western Australian Herbarium 1998–). It has historically been collected across a number of sites in the Perth region; however, the health of many of these populations is currently unknown, as this taxon occurs in areas that are under increasing pressure from on-going development, increased fire frequency and dense weed infestations. Further survey is required to confirm its current distribution and conservation status.

Affinities. This taxon differs from *L. glutinosum* subsp. *latifolium* in the outer calyx and pedicel being covered in viscid glands only (or rarely with scattered stellate hairs) rather than moderately dense to dense, stellate hairs. Mature leaves are generally longer (> 30 mm long *cf.* < 30 mm long), narrowly ovate and usually strongly trilobed (with the lobes *c.* > 3 mm wide). A few specimens from areas where the two subspecies of *L. glutinosum* overlap have strongly trilobed leaves and glabrous, viscid pedicels typical of subsp. *glutinosum* but stellate hairs at the base of the calyx reminiscent of subsp. *latifolium* (e.g. *D. Lamont s.n.*, PERTH 01169114 and *B. Nyanatusita* 206 from around Serpentine Falls; *T.E.H. Aplin* 304 from Red Hill). Due to this overlap these taxa are not being recognised as distinct species. Further morphological complexity within *L. glutinosum* subsp. *latifolium* is discussed below.

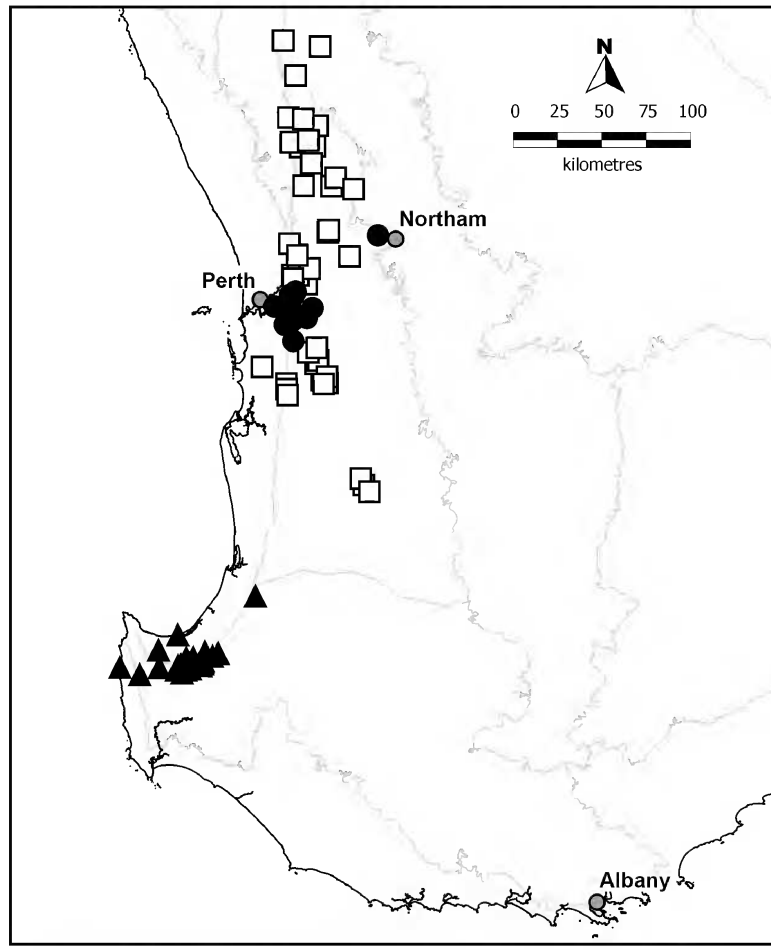

Figure 3. Distribution of *Lasiopetalum glutinosum* subsp. *glutinosum* (●), *L. glutinosum* subsp. *latifolium* (□), and *L. laxiflorum* (▲) in Western Australia.

The lack of stellate hairs on the outer calyx is a feature also shared with *L. trichantherum* and *L. laxiflorum*. *Lasiopetalum glutinosum* can be distinguished from the former by its glabrous anthers (*cf.* presence of dense stellate hairs) and from the latter through a lack of petals, and leaves with strongly recurved, rather than flat margins.

Lasiopetalum glutinosum subsp. **latifolium** (Benth.) K.A.Sheph. & C.F.Wilkins, *comb. nov.*

Thomasia glutinosa var. *latifolia* Benth., *Fl. Austral.* 1: 256 (1863). *Type citation*: 'Swan River, *Drummond*, 1st *Coll.*, *Preiss*, *n.* 1636 and 1641'. *Type specimens*: Swan R[iver, Western Australia, 1835–1838], *J. Drummond s.n.* (*lecto*, here designated: K! [both fragments]; *isolecto*: CGE 06801!, CGE 12649!, CGE 12647!, ?M 211234 image seen, ?NSW 385988); In N. Holl. austr. occ. Herb. Preiss. No. 1641 (*syn*: G 00358674 image seen; LD 1632027!, MEL 1620733 [fragment] image seen); In N. Holl. austr. occ. Herb. Preiss. No. 1636 (*syn*: LD 1241893!).

Thomasia canescens Lindl., *Sketch Veg. Swan R.* xviii (1839). *Rhynchostemon canescens* (Lindl.) Steetz. in Lehm., *Pl. Preiss* 2(2–3): 335 (1846). *Rhynchostemon caulescens orth. var.* A.D. Chapm.,

Australian Plant Name Index 2517 (1991). *Thomasia caulescens orth. var.* A.D. Chapm., *Australian Plant Name Index* 2848 (1991). *Type*: not cited. *Type specimen*: Swan River [Western Australia], 1839 [1835–1838], *J. Drummond s.n.* (*lecto*, here designated: CGE 06801!; *isolecto*: CGE 12649!, CGE 12647!, K! [both fragments], ?M 211234 image seen, ?NSW 385988!).

Thomasia aemula Steud. in Lehm., *Pl. Preiss.* 1(2): 233 (1845) *Type citation*: 'In N. Holl. austr. occ. Herb. Preiss. No. 1641' (*syn*: G 00358674 image seen; LD 1632027!, MEL 1620733 [fragment] image seen).

Thomasia lasiopetaloides Steud. in Lehm., *Pl. Preiss.* 1(2): 223 (1845). *Type citation*: 'In N. Holl. austr. occ. Herb. Preiss. No. 1636' (*syn*: LD 1241893!).

Leaf blades ovate or shallowly trilobed, 10–25(–53) mm long, 3–40(–44) mm wide, base cordate, apex sub-acute or acute. *Pedicels* 4.5–9 mm long, viscid, with moderately dense, sessile, white and ferruginous-centred, stellate hairs, over smaller, white, stellate hairs and minute, globular glands *c.* 0.1 mm across. *Calyx* outer surface viscid with dense, globular glands *c.* 0.1 mm across, and moderately dense to dense, white, stellate hairs near the base, the hairs with *c.* 6 arms each 1–1.5(–2) mm long. (Figure 2A, C)

Selected specimens. WESTERN AUSTRALIA: Red Hill, 6 Nov. 1958, *T.E.H. Aplin* 304 (PERTH); E of Mogumber, 16 Oct. 2007, *J.M. Collins* 375 (PERTH); Wannamal, 18 Sep. 1983, *R.J. Cranfield* 4198 (PERTH); Western Australia, *s. dat.*, *J. Drummond* 62 (BM 31026); S of Boddington, 8 Sep. 1980, *D. Halford* 801017 (PERTH); Armadale Road, 5 Nov. 1952, *H. de la Hey* 80 (BM 31024!); Flat Rock Gully Nature Reserve, Toodyay West, 7 Nov. 2006, *F. Hort* 2927 (PERTH); Parkerville, 21 Nov. 1962, *F. Lullfitz* L 1686 (PERTH); NE of Walebing, 9 Oct. 1972, *S. Paust* 1323 (PERTH); E of Roe Highway bypass on Toodyay Road, 21 Sep. 1994, *K. Shepherd & C.F. Wilkins* KS 119 (PERTH); 22.9 km S on Albany Highway from the junction with South Western Highway, 14 Oct. 2014, *K. Shepherd & S.R. Willis* KS 1564 (PERTH); 27 km S on Albany Highway from the junction with South Western Highway, 14 Oct. 2014, *K. Shepherd & S.R. Willis* KS 1565 (CANB, PERTH); 15 km from Bindoon–Dewars [Pool] Road on Great Northern Highway, 9 Oct. 1995, *K.A. Shepherd & J.A. Wege* KS 244 (PERTH); S of Moora, 3 Nov. 1974, *D.J.E. Whibley* 4993 (PERTH); Sullivan's Rock area, 17 Nov. 1993, *C.F. Wilkins* CW 354 (PERTH); Bindoon Army land, 24 Feb. 2006, *C.F. Wilkins, F. & J. Hort* CW 2150 (PERTH).

Phenology. Flowering specimens recorded from September to December. Fruiting material observed from December to February.

Distribution and habitat. *Lasiopetalum glutinosum* subsp. *latifolium* is found from Badgingarra to Boddington (Figure 3) in the Avon Wheatbelt, Geraldton Sandplains, Jarrah Forest and Swan Coastal Plain bioregions of Western Australia, in *Eucalyptus wandoo*, *E. marginata* and *Corymbia calophylla* open woodland over heath on granite or lateritic outcrops, ironstone and dolerite cobbles on lateritic gravel, and sandy clay.

Conservation status. This subspecies is reasonably widespread and is not considered to be under threat.

Typification. Lindley (1839) described *Thomasia canescens* as a species distinct from *T. glutinosa*; however, Bentham later subsumed this species under *T. glutinosa* var. *latifolia* (along with Steudel's *T. aemula* and *T. lasiopetaloides*).

Thomasia glutinosa var. *latifolia*

Bentham cited the following collections 'Swan River, *Drummond*, 1st *Coll.*, *Preiss*, *n.* 1636 and 1641' under *T. glutinosa* var. *latifolia*. The *Preiss* 1641 and 1636 collections located to date are of generally poor quality and it is unclear whether Bentham examined these specimens in person. Similarly, while Bentham may well have viewed the *Drummond* collections of *T. canescens* in Lindley's personal herbarium at CGE, there are no annotations by him to indicate that he did so. The lectotype of *T. glutinosa* var. *latifolia* is therefore chosen from a mixed sheet at the Royal Botanic Gardens, Kew stamped 'Herbarium Hookerianum 1867' as the two left hand fragments are a good match with Bentham's protologue and are identified in his handwriting as '*Thomasia canescens* Lindl. [and] *Rhynchostemon canescens* Steetz' below a handwritten 'Swan R. *Drummond*' label. Another specimen to the right is orientated upside down and does not represent type material. It is a *W. Mylne* collection from the Swan River with strongly trilobed leaves typical of *L. glutinosum* subsp. *glutinosum* but with stellate hairs at the base of the calyx more akin to *L. glutinosum* subsp. *latifolium*. As such, this collection is similar to the intermediate specimens noted under the *Affinities* section of *L. glutinosum* subsp. *glutinosum*.

Thomasia canescens

Potential type material of *T. canescens* housed at the Cambridge University Herbarium include two sheets from Lindley's personal herbarium (CGE 06801, CGE 12649), both of which have a small typed label 'Swan River, *Drummond* 1839', and a third sheet also with a handwritten 'Swan River, *Drummond*' label, from the Herbarium of C.M. Lemann (CGE 12647). These three specimens match Lindley's protologue; however, the status of CGE 12649 appears to have been questioned by the author, as it was labelled as '*Thomasia canescens* var.?'. As such, the remaining specimen in Lindley's herbarium (CGE 06801) is selected as the lectotype with the other two specimens, and a specimen at K, designated as isolectotypes. Two further Swan River, *Drummond* collections representing possible isolectotypes have been located at the National Herbarium of New South Wales (NSW 385988!) and Botanische Staatssammlung München (M 211234 image seen).

Thomasia aemula

It is evident from his determination that Steudel viewed the *Preiss* No. 1641 sheet of *T. aemula* currently housed at Lund University (LD 1632027); however, this material is sterile. Two other sheets representing type material of *T. aemula* have been located at the Conservatoire et Jardin botaniques de la Ville de Genève (G 00358674) and the National Herbarium of Victoria (MEL 1620733). The specimen in Geneva, annotated as an isotype by G. Guymer in 1983, is in agreement with the protologue. The material at MEL is comprised of a small fragment with three leaves and a single flower. It is not clear if Steudel viewed the specimens at G and MEL and, given the poor quality of the LD material, coupled with the possibility of further type material being relocated, these three sheets are currently regarded as syntypes.

Thomasia lasiopetaloides

A single *Preiss* No. 1636 sheet annotated by Steudel as *T. lasiopetaloides* is at Lund University (LD 1241893). As there may be additional sheets of type material potentially viewed by Steudel housed in other international herbaria (Stafleu & Cowan 1985: 907–908), this specimen is currently regarded as a syntype.

Affinities. *Lasiopetalum glutinosum* subsp. *latifolium* differs from other rostrate-anthered taxa in having moderately dense to dense, stellate hairs at the base of the outer calyx, rather than being glabrous or with a few, scattered, stellate hairs (as seen in *L. laxiflorum*, *L. glutinosum* subsp. *glutinosum* and *L. trichantherum*) or hairs over the whole outer calyx (as evident in *L. venustum* and *L. cenobium*). Its ovate to narrowly ovate mature leaves are generally not strongly trilobed which further distinguishes it from *L. venustum* and typical *L. glutinosum*.

Notes. Considerable morphological variation in leaf shape, calyx lobe and lobe apex shape, and density of hairs on the pedicel and outer calyx remains within *L. glutinosum* subsp. *latifolium*, particularly between the southern, central and northern distributions of the group. Specimens near Sullivan's Rock and Mt Vincent have broadly ovate leaves and moderately dense hairs on the inner calyx (e.g. *T.R. Lally & B. Fuhrer* TRL1432; *C. Wilkins* CW336). In the Boddington area, particularly near Mt Saddleback, specimens have smaller leaves and flowers (e.g. *D. Halford* 801017; *A. Morrison s.n.*, PERTH 02705745) while specimens from around Mogumber may have papillose glands rather than stellate hairs on the ovary (see comments under *L. cenobium*). These differences cannot be consistently delineated and it is not clear if any of these combinations of characters are taxonomically informative. Judicious field collections and the employment of molecular sequencing across known populations of the *L. glutinosum* complex may help to further clarify our taxonomic understanding of this variable species.

Lasiopetalum laxiflorum (Benth.) F.Muell., *Fragm.* 11(93): 112 (1881). *Thomasia laxiflora* Benth., *Fl. Austral.* 1: 256 (1863). *Type citation*: 'Swan River [Western Australia], *Drummond*, *Coll.* 1843, *n.* 25.' (*lecto*, here designated: K 000686006!; *isolecto*: ?CGE 13002!, G 00358676 image seen, G 00358677 image seen, K 000686005! [left hand specimen and fragment 'a'], K 000686007!, LD 1628362!, MEL 236398!, NSW 383585!, PERTH 01626639 [fragment]!).

Multi-stemmed, straggling, viscid, *subshrub to shrub* 0.3–1.5 m high, 0.2–1.5 m wide. *Stems* densely stellate-tomentose, with short-stalked (*c.* 0.2 mm long), white and ferruginous-centred, stellate hairs with 8–12 arms each 0.2–0.7 mm long, over smaller, dense, sessile, white, stellate hairs, glabrescent. *Petioles* 7–28 mm long, with indumentum as for young stems. *Leaf blades* ovate or narrowly ovate, (5–)22–65 mm long, (3–)11–75 mm wide, base cordate or rounded, apex sub-acute or acute, discolorous (green adaxially, pale tan abaxially); margin entire and flat to scarcely recurved; abaxial surface tomentose with sessile, white and ferruginous-centred, stellate hairs with 12–16 arms each to 0.3 mm long, over smaller, white, stellate hairs; adaxial surface with scattered to moderately dense, sessile, white, stellate hairs with *c.* 4–7(–10) arms each to 0.4 mm long, intermixed with scattered, white, glands to *c.* 0.1 mm long on the younger leaves, glabrescent, sometimes with hairs remaining in vein impressions. *Inflorescence* a leaf-opposed, lax monochasium, frequently with subsidiary monochasial cymes, 53–118 mm long with 6–25 flowers; *peduncles* 19–50 mm long, indumentum as for young stems. *Pedicels* 4.5–7.5(–10) mm long, viscid with dense, dark red, globular glands *c.* 0.1 mm across, glabrous or with scattered, white, stellate hairs with *c.* 6 arms each to 0.3 mm long. *Bract* very narrowly ovate or linear, 1.4–2.8 mm long, 0.3–0.5 mm wide. *Epicalyx bracts* 3, slightly unequally attached 0.2–0.8 mm below the calyx, linear or very narrowly ovate, 1.5–3.5 mm long, 0.2–0.3 mm wide, central longer and wider than laterals. *Calyx* bright pink with dark red base, 5.5–8.5 mm with a tube 2.1–3.5 mm long; lobes broadly ovate, (3–)5.1–5.8 mm long, (2.5–)4.4–5.8 mm wide, acuminate; outer surface viscid with dense, dark red, globular glands *c.* 0.1 mm across, infrequently with scattered, sessile, white, stellate hairs with *c.* 6 arms each to 0.5 mm long; inner surface lobe apex and margin with dense, white, stellate hairs with *c.* 10 arms each to 0.3 mm long, glabrous towards the base. *Petals* dark red, ovate, 0.8–1.4 mm long, 0.7–1.2 mm wide, glabrous or with a single, stellate hair towards the apex. *Staminal filaments* glabrous, 1.5–2 mm long, 0.3–4 mm wide. *Anthers* narrowly

ovate, dark red, white towards the apex, 2.5–4 mm long, 0.5–1.1 mm wide, glabrous; pollen white. *Ovary c.* 1.5 mm long, 1.5 mm wide, outer surface tomentose with white, stellate hairs; inner surface glabrous. *Style* 2.8–4.1 mm long, 0.15 mm wide, glabrous with dense, white, stellate hairs at the base. *Fruit* and seed not seen. (Figure 4)

Figure 4. *Lasiopetalum laxiflorum*. A – habit; B – inflorescence with dense stellate hairs on the peduncles, glabrous pedicels, and very short bracts and short epicalyx bracts subtending the calyx; C – flowers showing the small, deep red petals opposite the rostrate anthers (*K.A. Shepherd & S.R. Willis* KS 1567). Images by K.A. Shepherd.

Diagnostic features. The presence of small petals, short bracts (1.4–2.8 mm long) and short epicalyx bracts (1.5–3.5 mm long) readily differentiates *L. laxiflorum* from all of the rostrate-anthered species of *Lasiopetalum*.

Specimens examined. WESTERN AUSTRALIA: [localities withheld for conservation purposes] 13 Oct. 2005, *E.M. Bennett s.n.* (PERTH); 16 Nov. 2001, *R.J. Cranfield* 17534 (PERTH); 29 Nov. 2001, *R.J. Cranfield* 17628 (PERTH); 13 Dec. 2001, *R.J. Cranfield* 17677 (PERTH); 17 Oct. 1973, *A.S. George* 11729 (PERTH); 11 Nov. 1993, *B.J. Keighery & N. Gibson* 1138 (PERTH); 9 Nov. 1987, *G.J. Keighery* 9485 (PERTH); 7 Dec. 2005, *A. O'Connor & B. Keighery s.n.* (PERTH); 16 Oct. 1997, *D. Papenfus* DP 702 (CANB, PERTH); 14 Oct. 1997, *D. Papenfus* DP 703 (PERTH); 14 Oct. 1997, *D. Papenfus* DP 704 (CANB, PERTH); 12 Nov. 1946, *R.D. Royce* 1422 (PERTH); 26 Oct. 2014, *K.A. Shepherd & S.R. Willis* KS 1567 (CANB, MEL, NSW, PERTH); 23 Sep. 2003, *A. Webb* AW 2294 (PERTH); 7 Dec. 1993, *C.F. Wilkins & K.A. Shepherd* CW 573 (PERTH); 1 Dec. 2000, *C.F. Wilkins* CW 1471 (PERTH).

Phenology. Flowering recorded from October to January.

Distribution and habitat. *Lasiopetalum laxiflorum* is restricted to the Whicher Range area (Figure 3) in the Jarrah Forest and Swan Coastal Plain bioregions of Western Australia. This species occurs in *Eucalyptus marginata*, *Corymbia*, *Allocasuarina* or *Banksia grandis* woodland or forest, in gravelly, brown clay over laterite, rarely in white sand.

Conservation status. *Lasiopetalum laxiflorum* is currently listed as Priority Three under Department of Parks and Wildlife Conservation Codes for Western Australian Flora (Jones 2014), as it is restricted to a narrow near-coastal region south of Busselton.

Affinities. The lack of stellate hairs on the outer calyx of *L. laxiflorum* is also seen in *L. trichantherum* and *L. glutinosum* subsp. *glutinosum*. However, *L. laxiflorum* is quite distinct from other species in the group due to the presence of small petals opposite the anthers, and shorter epicalyx bracts (1.5–3.5 mm long *cf.* 3–14 mm long). The leaves are also distinct, having flat margins and the abaxial surfaces covered in tomentose, stellate hairs.

Typification. Nine sheets labelled *Drummond* n. 25 have been examined. The K 686006 sheet is selected as the lectotype as it is a good match for Bentham's protologue, was a part of his personal herbarium (denoted with a 'BENTHANIANUM HERBARIUM 1854' stamp) and bears a 'Swan River Drummond' label written in his hand. A second sheet housed at Kew includes two specimens and a smaller fragment. The left hand specimen and fragment labelled 'a' (K 686005) are designated as isolectotypes, while the right hand 'b' individual (K 686004) has no type status, having been collected in 1843 from Augusta, Western Australia by John Gilbert ('*Gilbert* n. 166'). CGE 13002 is an unnumbered Drummond collection from 1843. It is comparable to the lectotype but as it has no collection number its status as an isolectotype is questionable.

Lasiopetalum trichantherum K.A.Sheph. & C.F.Wilkins, *sp. nov.*

Type: Bobakine Nature Reserve, Western Australia [precise locality withheld for conservation reasons], 2 November 2005, *C.F. Wilkins & A. Brearley* CW 2131 (*holo*: PERTH 07906455!; *iso*: AD!, BRI!, CANB!, K!, MEL!).

Lasiopetalum sp. Northam (F. Hort 1196), Western Australian Herbarium, in *FloraBase*, http://florabase.dpaw.wa.gov.au/ [accessed 3 July 2014].

Multi-stemmed, erect to straggling, viscid, *shrub* 0.8–1.2 m high, 0.8–1.5 m wide. *Stems* stellate-tomentose, with stalked (to 0.5 mm long), white and ferruginous-centred, stellate hairs with 8–24 arms each to 0.8 mm long, over sessile or short-stalked, white and ferruginous-centred, stellate hairs, glabrescent. *Petioles* (2.3–)3.5–8 mm long, with indumentum as for young stems. *Leaf blades* ovate, (3–)5–18.5 mm long, (2.5–)4–15 mm wide, base strongly cordate, apex sub-acute, discolorous (grey-green adaxially, pale grey-green abaxially); margin entire, flat to recurved; abaxial surface densely stellate-tomentose with sessile and stalked, white and ferruginous-centred stellate hairs with up to 12 arms each to 0.5 mm long, over smaller, white, stellate hairs; adaxial surface with scattered to moderately dense, sessile, white, stellate hairs with 6–12 arms each to 0.5 mm long, eventually glabrescent. *Inflorescence* a leaf-opposed monochasium, 60–100 mm long with 3–7 flowers; *peduncles* 17–53.5 mm long, indumentum as for stems. *Pedicels* 2.3–8.3 mm long, viscid with dense, globular glands *c.* 0.1 mm across. *Bract* narrowly ovate, 1.8–3.6 mm long, 0.4–0.7 mm wide. *Epicalyx bracts* 3, attachment towards the base of the pedicel, narrowly elliptic, lanceolate or narrowly ovate, 3–6 mm long, 0.5–1.5 mm wide, central bract longer and wider than laterals. *Calyx* bright pink with dark red base, 8–12 mm with a tube 1.2–3.7 mm long; lobes narrowly ovate to elliptic, 5.7–7.2 mm long, 2.2–2.7(–3.3) mm wide, acute; outer surface viscid with dense, globular glands *c.* 0.1 mm towards the base; inner surface lobe apex and margin with moderately dense, white, simple and stellate hairs *c.* 0.1 mm long, glabrous towards the base. *Petals* absent. *Staminal filaments* glabrous, 1.5–2.3 mm long, 0.2–0.3 mm wide. *Anthers* narrowly ovate, dark red with apical third white, 3.7–4.5 mm long, 0.8–0.9 mm wide, with dense, white, stellate hairs; pollen white. *Ovary* 1.5–1.8 mm long, 1.5–1.8 mm wide, outer surface tomentose with white, stellate hairs to 0.4 mm long; inner surface glabrous. *Style* 2.3–3.1 mm long, glabrous, with scattered, white, stellate hairs at the base. *Fruit* ellipsoid, 4–6 mm long, 4–4.3 mm wide, outer surface with white, stellate hairs to 0.4 mm long, inner surface glabrous. *Seed* ellipsoid, *c.* 2.3 mm long, 1.3 mm wide, dark brown, smooth, with white, stellate hairs, glabrescent; aril a yellow cap, *c.* 1 mm long, 0.9 mm wide. (Figure 5)

Diagnostic features. The distinctive stellate hairs present on the anthers readily distinguish this species within the rostrate-anthered group. The position of the epicalyx towards the base of the pedicel rather than subtending the calyx, the narrow calyx lobes and the presence of stellate hairs on the seeds are also features particular to this species.

Figure 5. *Lasiopetalum trichantherum*. A – inflorescence with dense stellate hairs on the peduncles and glabrous pedicels; B – flowers with short, narrow epicalyx bracts at the base of the glabrous pedicel, narrowly ovate to elliptic calyx lobes and distinctive anthers covered in dense, white hairs. Images by J. & F. Hort.

Specimens examined. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 9 Oct. 2007, *J.M. Collins* 330 (PERTH); 3 Feb. 2009, *A. Crawford* ADC 1979 (K, PERTH); 22 Oct. 2000, *F. & J. Hort* 1196 (PERTH); 5 Oct. 2001, *F. & J. Hort* 1498 (PERTH); 5 Oct. 2008, *F. & J. Hort* 3317 (PERTH).

Phenology. Flowering specimens recorded from October to February. Fruiting observed from January to February.

Distribution and habitat. *Lasiopetalum trichantherum* is restricted to two nature reserves near Northam in Western Australia (Figure 3) in the Jarrah Forest bioregion. It is usually found mid-hillslope in open Jarrah-Marri woodland over tall shrubland, or scattered *Eucalyptus wandoo* and *Banksia menziesii* woodland over shrubland in grey-white or white, gritty sand with quartzite rock.

Conservation status. *Lasiopetalum trichantherum* is restricted to two, small populations in reserves and is listed as Priority Two under Department of Parks and Wildlife Conservation Codes for Western Australian Flora under the name *Lasiopetalum* sp. Northam (F. Hort 1196) (Jones 2014).

Etymology. The epithet is from the Greek *trich-* (hair) and *anthera* (anther), in reference to the hairy anthers that are characteristic of this species.

Affinities. *Lasiopetalum trichantherum* is similar to *L. glutinosum* subsp. *glutinosum* in having a glabrous, viscid outer calyx and pedicels, but differs from this and other species in having anthers which are covered in stellate hairs rather than being glabrous, and having narrowly ovate to elliptic calyx lobes that narrow towards the base in contrast to the ovate to broadly ovate calyx lobes observed in other species.

Lasiopetalum venustum K.A.Sheph. & C.F.Wilkins, *sp. nov.*

Type: Boonanarring Nature Reserve, Western Australia [precise locality withheld for conservation reasons], 30 September 2002, *C.F. Wilkins & J.A. Wege* CW 1613 A (*holo*: PERTH 07968736!; *iso*: BRI!, CANB!, MEL!, NSW!).

Thomasia sp. Gingin (F. & J. Hort 1511), Western Australian Herbarium, in *FloraBase*, http://florabase.dpaw.wa.gov.au/ [accessed 3 July 2014].

Erect, *shrub*, 0.85–1.5 m high, 0.85–1.5 m wide. *Stems* tomentose, with scattered, stalked (to 0.5 mm long), ferruginous, stellate hairs with up to 12 arms each to 0.8 mm long, over smaller, sessile or short-stalked, white and ferruginous-centred, stellate hairs, glabrescent. *Petioles* 4–22 mm long, indumentum as for stems. *Leaf blades* ovate and persistently trilobed, (9–)13–40 mm long, (5–)18–32 mm wide, base strongly cordate, apex sub-acute to obtuse, discolorous (mid-green adaxially, grey-green abaxially); margin recurved; abaxial surface with scattered, ferruginous, stellate hairs with 6–12 arms each to 0.4 mm long, over smaller, sessile and short-stalked, white and ferruginous-centred, stellate hairs confined to leaf veins; adaxial surface with scattered to moderately dense, sessile, white and ferruginous-centred, stellate hairs with 6–12 arms each to 0.6 mm long. *Inflorescence* a leaf-opposed, loose, simple monochasium, 61–123 mm long with 4–12 flowers; *peduncles* 28.1–72 mm long, indumentum as for stems, intermixed with scattered, red, stalked, glandular trichomes to 0.5 mm long. *Pedicels* 4.5–9.2 mm long, indumentum as for peduncles. *Bract* filiform, 6–14 mm long, 0.2–0.3 mm wide. *Epicalyx bracts* 3, attachment 0.2–1.2 mm below the calyx, filiform, 6–12 mm long, 0.2–0.4 mm wide. *Calyx* pink

with dark red and green base, 8–10.1 mm with a tube 1.3–2 mm long; lobes ovate, 4–8.5 mm long, 3.5–7.5 mm wide, acuminate; outer surface with dense, large, white, stellate hairs at base, hairs with 6–12 arms each to 1 mm long, becoming *c.* 0.2 mm long towards apex, and scattered, red, sessile and stalked, glandular trichomes to 0.2 mm long; inner surface with fine, stalked and sessile, glandular trichomes to 0.2 mm long at base and central lobe, with moderately dense, fine, white, simple and stellate hairs *c.* 0.2 mm long towards the apex. *Petals* absent. *Staminal filaments* glabrous, 1–1.2 mm long, 0.2–0.3 mm wide. *Anthers* narrowly ovate, dark red with apical third white, 3.6–4.7 mm long, 0.9–1.2 mm wide, glabrous; pollen white. *Ovary* 0.9–1.6 mm long, 0.8–1.7 mm wide; outer surface with dense, white, stellate hairs to 0.8 mm long; inner surface glabrous. *Style* 2.8–3.5 mm long, 0.15 mm wide, glabrous with scattered, white, stellate hairs at the base. *Fruit* ellipsoid, *c.* 3.4 mm long, 4 mm wide, outer surface with white, stellate hairs to 0.4 mm long, inner surface glabrous. *Seed* ellipsoid, *c.* 2.3 mm long, 0.9 mm wide, dark brown, smooth, glabrous; aril a yellow-cream cap, *c.* 1 mm long, 0.9 mm wide. (Figure 6)

Diagnostic features. *Lasiopetalum venustum* differs from other rostrate-anthered species in the genus by the following combination of characters: narrow, persistently trilobed leaves with the two lateral lobes constricted almost to the midvein; stellate hairs on the abaxial leaf surface confined to the veins; filiform bracts; stellate hairs over the outer surface of calyx, and stalked and sessile glands scattered over the inner surface of the calyx.

Specimens examined. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 27 Sep. 2007, *R. Butcher, F. & J. Hort* RB 1167 (PERTH); 27 Aug. 2007, *D. Coultas & K. Greenacre* Opp. 14 (PERTH); 1 Dec. 2005, *A. Crawford* ADC 1020 (K, PERTH); 12 Oct. 2001, *F. & J. Hort* 1511 (PERTH); 23 Oct. 2001, *F. Hort* 1563 (PERTH); 5 Nov. 2001, *F. Hort* 1615 (PERTH); 7 Jan. 2006, *F. Hort* 2770 (PERTH).

Phenology. Flowering from October to January. Fruiting specimens observed from December to January.

Distribution and habitat. *Lasiopetalum venustum* is restricted to a reserve north of Gingin, in the Swan Coastal Plain bioregion. This species is found in open Jarrah-Marri and Wandoo woodland with *Macrozamia*, *Xanthorrhoea* and *Acacia* shrubland on gravelly loam, among exposed granite boulders.

Conservation status. Currently listed as Priority Three under Department of Parks and Wildlife Conservation Codes for Western Australian Flora under the name *Thomasia* sp. Gingin (F. & J. Hort 1511) (Jones 2014). While only known from one reserve, this species is plentiful within it.

Etymology. The epithet is from the Latin *venustum* (attractive, charming, pretty) as this species, like many species of *Lasiopetalum*, is very attractive and has horticultural potential.

Affinities. *Lasiopetalum venustum* shares the feature of long, filiform bracts with *L. cenobium* but can be distinguished from this species by the smooth rather than rugose leaves, the ovary covered in dense, white, stellate hairs rather than being papillose, with the inner surface being glabrous rather than stellate-hairy.

Lasiopetalum venustum has trilobed mature leaves like *L. glutinosum* var. *glutinosum*, although the two lateral lobes are more constricted towards the midvein in the latter. It also has dense, stellate hairs over the whole outer surface of the calyx (*cf.* glabrous or with a few scattered stellate hairs at the base) and glandular hairs across the inner surface of the calyx.

Figure 6. *Lasiopetalum venustum*. A – habit; B – strongly trilobed leaves and inflorescences with dense stellate hairs on the peduncles, pedicels, filiform epicalyx bracts and outer calyx; C – flowers with ovate calyx lobes and typical rostrate, dark red anthers with white apices. Images by J. & F. Hort.

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